

DIRECT TESTIMONY OF
GLENN HUBBARD, PH.D.
ON BEHALF OF
SOUTH CAROLINA ELECTRIC & GAS COMPANY
DOCKET NOS. 2017-207-E AND 2017-305-E

1 **Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

2 A. My name is Robert Glenn Hubbard, and my business address is Graduate
3 School of Business, Columbia University, 101 Uris Hall, 3022 Broadway, New
4 York, New York 10027.

5 **Q. BRIEFLY DESCRIBE YOUR QUALIFICATIONS.**

6 A. I am the Dean of the Graduate School of Business at Columbia University,
7 where I hold the Russell L. Carson Professorship in Finance and Economics. In
8 addition, I am a Professor of Economics in the Department of Economics of the
9 Faculty of Arts and Sciences.

10 I received my B.A. and B.S. degrees in Economics from the University of
11 Central Florida (summa cum laude) in 1979, an A.M. in Economics from Harvard
12 University in 1981, and a Ph.D. in Economics from Harvard University in 1983.
13 During my professional career I have held many academic and government
14 positions. From 1981 to 1983, I served as a Teaching Fellow and Resident Tutor at
15 Harvard University. After receiving my Ph.D. in 1983, I served as a professor of
16 economics at Northwestern University until 1988. During that time, I also held a

1 half-time research appointment in the Center for Urban Affairs and Policy Research.
2 Additionally, I served from 1987 to 1988 as a John M. Olin Fellow in residence at
3 the National Bureau of Economic Research. In 1988, I became a professor of
4 economics and finance at Columbia University. I served as the Senior Vice Dean
5 of the Graduate School of Business from 1994 to 1997 and have served as Dean of
6 the Graduate School of Business at Columbia since 2004. During my service at
7 Columbia, I also have served as a visiting professor or visiting scholar at the
8 University of Chicago, Harvard, and the American Enterprise Institute. I have been
9 an advisor or consultant to the Board of Governors of the Federal Reserve System,
10 Congressional Budget Office, Federal Reserve Bank of New York, Internal
11 Revenue Service, International Trade Commission, National Science Foundation,
12 U.S. Department of Energy, and U.S. Department of the Treasury. From 1991 to
13 1993, I served as Deputy Assistant Secretary (Tax Analysis) of the U.S. Department
14 of the Treasury, where I was responsible for economic analysis of tax policy, the
15 administration's revenue estimates, and health care policy issues. From 2001 to
16 2003, I served as Chairman of the President's Council of Economic Advisers. Over
17 that time period, I also served as Chair of the Economic Policy Committee for the
18 Organization for Economic Cooperation and Development in Paris.

19 **Q. ARE YOU THE SAME GLENN HUBBARD WHO PREVIOUSLY FILED**
20 **DIRECT TESTIMONY IN DOCKET NO. 2017-370-E?**

21 A. Yes. On August 2, 2018, South Carolina Electric & Gas Company
22 ("SCE&G" or the "Company") and Dominion Energy, Inc. ("Dominion Energy")

1 (together, the “Joint Applicants”) filed in Docket No. 2017-370-E my direct
2 testimony consisting of 56 pages and 2 exhibits. In that testimony, I assess and
3 evaluate the impact of South Carolina Joint Resolution Ratification No. 285 and Act
4 No. 287 (together, the “Acts”) on SCE&G, its customers, and the general public
5 interest of the state of South Carolina. In addition, my testimony addresses the
6 impact on these stakeholders if the rate reduction imposed by the Acts is made
7 permanent by the Public Service Commission of South Carolina (the
8 “Commission”).

9 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS**
10 **PROCEEDING?**

11 A. I have been retained on behalf of SCE&G to provide analysis of, and expert
12 testimony about, some of the financial consequences to SCE&G and its customers
13 that may result if the Commission eliminates the revenue from revised rates of
14 roughly \$37 million per month, as requested by the South Carolina Office of
15 Regulatory Staff (“ORS”) in Docket No. 2017-305-E and by Friends of the Earth
16 and the Sierra Club in Docket No. 2017-207-E.

17 **Q. HAVE YOU RECENTLY PROVIDED TESTIMONY ON THIS TOPIC TO**
18 **THE COMMISSION?**

19 A. Yes. As stated previously, on August 2, 2018, my direct testimony in Docket
20 No. 2017-370-E was filed in which I address the same topics referenced above.
21 Therefore, I respectfully request that such testimony be incorporated in this docket
22 and have attached a copy thereof to this testimony as Appendix A.

1 **Q. HAVE YOU REVIEWED THE TESTIMONY THAT DR. MARK COOPER**
2 **FILED IN DOCKET NOS. 2017-207-E, 2017-305-E, AND 2017-370-E ON**
3 **AUGUST 13, 2018?**

4 A. Yes.

5 **Q. DOES DR. COOPER'S TESTIMONY CAUSE YOU TO RECONSIDER OR**
6 **REVISE THE TESTIMONY YOU FILED IN DOCKET NO. 2017-370-E?**

7 A. No. My previously filed testimony remains true and correct.

8 **Q. ARE THERE POINTS ADVANCED IN DR. COOPER'S TESTIMONY**
9 **WITH WHICH YOU DISAGREE? IF SO, PLEASE IDENTIFY THE**
10 **POINTS OF DISAGREEMENT.**

11 A. Yes. Dr. Cooper states that: "it is abundantly clear that all of the costs
12 incurred since [2012] are imprudent" and that recent information raises "additional
13 considerations that drive the finding of imprudence even farther back in the history
14 of the project."¹ Dr. Cooper concludes that: "all of the costs incurred by the utility
15 for the abandoned nuclear project should be disallowed as imprudent pursuant to
16 the BLRA and generally accepted principles of utility regulation."² There are at
17 least three flaws in this portion of Dr. Cooper's testimony from an economic
18 perspective that undercut his conclusion and about which he is in error.

19 **Q. PLEASE DESCRIBE THE FIRST FLAW IN DR. COOPER'S TESTIMONY.**

¹ Direct Testimony of Dr. Mark Cooper, South Carolina Public Service Commission, Docket Numbers 2017-207-E, 2017-305-E and 2017-370-E, filed August 13, 2018 ("Cooper Testimony"), at 7.

² Cooper Testimony, at 45.

1 A. The first flaw in Dr. Cooper’s testimony is that he relies on hindsight bias in
 2 his assessment of purported flaws in SCE&G’s economic analyses of the nuclear
 3 project at issue (“Nuclear Project” or “Nuclear Units”) versus a natural gas
 4 combined cycle alternative. As I noted in my prior testimony, prudence under the
 5 BLRA is an *ex ante* concept, meaning that the prudence of past decisions regarding
 6 the Nuclear Project must be evaluated only on the basis of what was known or
 7 reasonably knowable at the time of each decision.³ This *ex ante* prudence review
 8 aspect of the BLRA is economically beneficial because it limits the risk to investors
 9 that regulators or politicians will apply hindsight in an opportunistic fashion to
 10 disallow recovery of costs that were prudently incurred.⁴ The limitation of this risk
 11 encourages optimal levels and types of investment and reduces the cost of capital,
 12 which in turn reduces the cost of service to customers because the cost of capital is
 13 passed on to customers in rates.

³ Direct Testimony of Glenn Hubbard, Ph.D., South Carolina Public Service Commission, Docket No. 2017-370-E, filed August 2, 2018 (“Hubbard Testimony”), at 22-27. The language of the BLRA relating to abandonment explicitly references this concept of an *ex ante* standard for prudence review: “... recovery of capital costs and the utility’s cost of capital associated with them may be disallowed only to the extent that the failure by the utility to anticipate or avoid the allegedly imprudent costs, or to minimize the magnitude of the costs, was imprudent **considering the information available at the time** that the utility could have acted [sic] to avoid or minimize the costs.” S.C. Code Ann. § 58-33-280(K) (emphasis added).

⁴ I note that ORS presentations from 2016 find that the Nuclear Project was a “[v]ery [g]ood [i]dea in 2008,” “BLRA [r]emains an [e]ssential [e]lement to [s]uccess,” and note that a recent independent study “indicates BLRA methodology reduces costs.” “Status of the V. C. Summer Units 2 & 3 Nuclear Power Plants,” Presentation to the Electric Cooperatives of South Carolina, Gary C. Jones, March 3, 2016 at 3, 5, 20 (a copy of which is attached as Exhibit ____ (GH-1)); “Status of the V. C. Summer Units 2 & 3 Nuclear Power Plants,” Presentation to South Carolina Energy Users Committee, Nanette S. Edwards, May 13, 2016 at 2, 7, 16 (a copy of which is attached as Exhibit ____ (GH-2)).

1 An example of Dr. Cooper's reliance on hindsight can be found in his
2 criticism of SCE&G's natural gas price forecasts as a "big repeated error."⁵ As
3 support for this claim, Dr. Cooper points out that SCE&G's 2008 forecast of the
4 price of natural gas prices in 2018 "was over 450% higher than the observed prices,"
5 which he characterizes as a "remarkable misestimation of gas prices."⁶ The large
6 decline in natural gas prices in the past decade does not demonstrate that SCE&G's
7 original 2008 forecasts were flawed *ex ante*. Market participants generally did not
8 forecast the dramatic decline in natural gas prices that occurred since 2008, which
9 was due in large part to the unforeseen success of new engineering technology that
10 created the fracking revolution.⁷ Thus, Dr. Cooper's reliance on the fact that, in
11 hindsight, gas prices in 2018 were significantly lower than projected in 2008, as
12 support for his position that prior decisions to construct or continue to construct the
13 Nuclear Units were imprudent, is misplaced.⁸ Indeed, if the Commission were to

⁵ Cooper Testimony, at 41. Natural gas price forecasts were an important input to the initial and subsequent assessments that were made under the BLRA to determine whether it made economic sense to construct or continue to construct the Nuclear Units, or to abandon them in favor of the next best alternative, which was determined to be a pair of natural gas combined cycle units. If natural gas prices were projected to be lower, then all else equal, the economics of the combined cycle option would compare more favorably to the economics of the Nuclear Units.

⁶ Cooper Testimony, at 41.

⁷ See, for example, Krauss, Clifford, "Natural Gas Prices Plummet to a Seven-Year Low," *New York Times*, August 20, 2009; Clemente, Jude, "Why U.S. Natural Gas Prices Will Remain Low," *Forbes*, September 24, 2017.

⁸ The analyses of the economics of the Nuclear Project versus the natural gas combined cycle alternative that SCE&G did in 2012 and beyond used updated gas price projections that were lower than the gas price projections from 2008. Furthermore, I understand that SCE&G's gas price forecasts in all BLRA proceedings were disclosed to the Commission, ORS, and the public, and were subject to scrutiny in the relevant prior dockets. Finally, one of the stated reasons for the original decision to pursue the Nuclear Project rather than the combined cycle option was that natural gas prices were highly volatile and, therefore, more risky. Direct Testimony of Joseph M. Lynch, South Carolina Public Service Commission, Docket No. 2017-370-E, filed August 2, 2018 ("Lynch Testimony"), at 9,

1 find that SCE&G's prior decisions to pursue the Nuclear Project were imprudent on
 2 the basis of this type of hindsight, it likely would be perceived by investors as
 3 regulatory opportunism and would have the negative economic effects described in
 4 my prior testimony.⁹

5 **Q. PLEASE DESCRIBE A SECOND FLAW YOU HAVE IDENTIFIED IN DR.**
 6 **COOPER'S TESTIMONY.**

7 A. A second flaw is that Dr. Cooper appears to base his conclusion in significant
 8 part on the incorrect view that Nuclear Project expenditures prior to the relevant
 9 decision or economic analysis dates, which financial economists refer to as "sunk
 10 costs," should count against the nuclear option but not the combined-cycle
 11 alternative.¹⁰ A leading corporate finance textbook explains the flaw in his logic as
 12 follows:

13 Sunk costs are like spilled milk: They are past and irreversible
 14 outflows. Because sunk costs are bygones, they cannot be affected by
 15 the decision to accept or reject the project, and so they should be
 16 ignored.¹¹

Exhibit H (Exhibit No. ____ (JML-2)), at 2. To the extent that was the case, the fact that gas prices have declined as much as they did is an *ex post* realization of that volatility, albeit to the downside rather than the upside.

⁹ Hubbard Testimony, at 7, 43, 45.

¹⁰ Dr. Cooper states that "[u]njustifiable, sunk costs were imposed on the alternatives" and that "all of the costs incurred by the utility for the abandoned nuclear project should be disallowed as imprudent." Cooper Testimony, at 6, 45. He also refers to the appropriate and standard economic practice of ignoring sunk costs as the "'To Go' Scam." Cooper Testimony, at 43-46.

¹¹ Brealey, Richard, Stewart Myers, and Franklin Allen (2017), *Principles of Corporate Finance*, 12th ed., New York: McGraw-Hill Education, at 137.

1 As applied to this case, this means that all costs of the Nuclear Project incurred prior
2 to the date of each analysis comparing the economics of continuing with the Nuclear
3 Project to abandoning it and switching to the combined cycle alternative are sunk
4 costs and must be ignored.¹²

5 **Q. PLEASE CLARIFY WHAT YOU MEAN WHEN YOU SAY THAT SUNK**
6 **COSTS MUST BE IGNORED WHEN ANALYZING THE NUCLEAR**
7 **VERSUS GAS INVESTMENT DECISIONS IN THIS CASE.**

8 A. A simple example may help clarify the point. Suppose at date T a utility has
9 already spent \$100 building a 100 MW nuclear unit and now must determine
10 whether to spend \$100 more to finish the nuclear unit or \$125 to build a 100 MW
11 gas unit. At the end of construction, the total cost to build 100 MW of generating
12 capacity will be either \$200 if the nuclear unit is finished or \$225 if the gas unit is
13 built because \$100 has already been spent in either case. Regardless of whether the
14 utility compares only the going forward costs of the two options (\$125 versus \$100)
15 or the total expenditures of the two options (\$225 versus \$200), the utility will come
16 to the same conclusion that finishing the nuclear unit is \$25 cheaper. The reason is
17 that the sunk costs “cancel out” when total costs are considered and are simply
18 excluded when incremental or going forward costs are considered. Either way, the

¹² The sunk costs must be ignored as part of the investment decision regardless of whether the costs are later determined to have been prudent or imprudent. If they are determined to have been prudent, then the costs would be recovered in customer rates under either the Nuclear Project or the combined cycle alternative. Similarly, if the costs are determined to have been imprudent, they would not be recovered under either alternative. Because the impact on customers is the same in either case, the sunk costs for the Nuclear Project are irrelevant to the economic comparison of the alternatives and therefore should not burden the nuclear option.

1 sunk costs are irrelevant (and must be ignored) because they have been spent under
2 both the nuclear and gas scenarios.

3 As this simple example makes clear, the appropriate approach in this case
4 from an economic perspective, which was applied by Dr. Lynch, is to compare the
5 difference in costs between the two options at each decision point based on the going
6 forward or projected future cost of each option, excluding sunk costs.¹³ Dr. Cooper
7 appears to affirm that this is the correct approach in his testimony when he states
8 that a “broad [principle] of utility ratemaking that [he] believe[s] still appl[ies]” is
9 that “[f]irms must make decisions on a forward looking basis, regardless of sunk
10 costs.”¹⁴ However, he chooses to disregard this relevant and accepted principle of
11 finance when he asserts that sunk costs should not be ignored for the nuclear option,
12 but should be ignored for a comparative natural gas option.

13 **Q. WHAT IS A THIRD FLAW IN DR. COOPER’S TESTIMONY?**

14 A. A third flaw in Dr. Cooper’s testimony is that he ignores the likely increase
15 in SCE&G’s cost of capital, as well as other negative economic effects, that would
16 result from his proposal that the Commission deny recovery of Nuclear Project costs
17 that were approved under the BLRA process.¹⁵ Rather, he discusses and attempts

¹³ Dr. Cooper refers to the remaining nuclear construction costs at each decision point as the “to-go” costs. Cooper Testimony, at 43.

¹⁴ Cooper Testimony, at 9.

¹⁵ Cooper Testimony, at 33-34.

1 to minimize the beneficial aspects of the BLRA as an efficient instrument of utility
2 ratemaking public policy.

3 While I disagree with his hindsight bias, focus on sunk costs, and his efforts
4 to minimize the beneficial aspects of the BLRA, I agree with Dr. Cooper that the
5 BLRA resulted in a lower cost of capital for SCE&G and its customers through the
6 law's provisions for advance prudence review and cost recovery. Indeed, I discuss
7 this point in my prior testimony, as well as other positive economic effects of the
8 BLRA, such as its impact on selection of the optimal mix of capacity through its
9 reduction of regulatory risk and the cost of capital.¹⁶

10 **Q. DO YOU DISAGREE WITH DR. COOPER'S CRITICISM OF THE BLRA**
11 **WHERE HE ASSERTS THAT THE "RISK SHIFTING" TO CUSTOMERS**
12 **UNDER THE BLRA MIGHT CREATE AN INCENTIVE FOR UTILITIES**
13 **"TO UNDERTAKE WASTEFUL PROJECTS?"**

14 **A.** Yes. This argument ignores the economically beneficial nature of the BLRA
15 process. As I discuss in my prior testimony, the whole point of advance prudence
16 review under the BLRA was to align incentives and appropriately apportion risk
17 between the Company and its customers through the regulatory process. This
18 process, if administered properly, can be expected to result in investments that the
19 Company and its regulators found to be prudent on an *ex ante* basis. Such
20 investments, by definition, are not "wasteful" from an economic perspective and

¹⁶ Hubbard Testimony, at 6, 24-25, 42. There may be additional benefits or costs that would be relevant for an analysis of the effect the BLRA and the abandonment would have on all stakeholders, including SCE&G, its investors, its employees, its customers, and residents of South Carolina.

1 apportion the appropriate amount and type of risk to customers from a regulated
2 industry perspective.

3 **Q. YOU MENTIONED THAT DR. COOPER IGNORES CERTAIN NEGATIVE**
4 **ECONOMIC CONSEQUENCES THAT HIS PROPOSED NUCLEAR COST**
5 **DISALLOWANCE WOULD HAVE ON SCE&G, ITS CUSTOMERS, AND**
6 **THE STATE OF SOUTH CAROLINA, AS DISCUSSED IN YOUR PRIOR**
7 **TESTIMONY. PLEASE EXPLAIN WHAT YOU MEAN.**

8 A. Yes. The key point of my prior testimony is that rewriting the agreement
9 based on an opportunistic *ex post* assessment of the project will have important
10 economic and financial consequences for SCE&G and its customers, all else equal.
11 Specifically, investors agreed to provide the capital needed to construct the nuclear
12 plants with the understanding that the Company would be able to recover all costs
13 that were incurred and deemed prudent under the BLRA process. If investors' funds
14 are effectively expropriated by abrogating this agreement, it will raise the cost of
15 capital for the Company going forward as well as reduce its incentive to invest.
16 Because the rates SCE&G's customers pay depend on its cost of capital, lowering
17 customers' rates today by opportunistically reducing or eliminating the BLRA-
18 related revenues may well result in higher rates for the future. In addition, all else
19 equal, such an action by the Commission would result in underinvestment by
20 SCE&G and, potentially, by other utilities in the State of South Carolina, thereby
21 having a broader negative economic impact on the state. Dr. Cooper ignores these

1 possible negative economic consequences of his recommendation that the
2 Commission disallow much of the Nuclear Project costs.

3 **Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?**

4 **A.** Yes, it does.